Tourism Management 70 (2019) 49–55

Contents lists available at ScienceDirect

Tourism Management

journal homepage: www.elsevier.com/locate/tourman

Wildlife viewing: The impact of money-back guarantees

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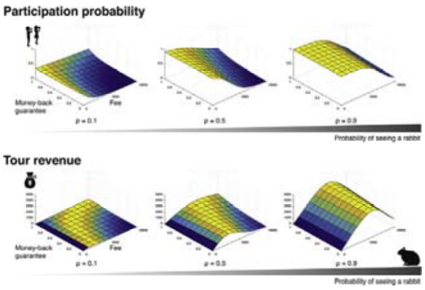
G R A P H I C A L A B S T R A C T



A R T I C L E I N F O

Keywords:
Conservation-tourism balance
Choice modelling
Ecotourism
Endangered species
Money-back guarantee
Sustainable tourism
Uncertainty
Wildlife tourism

A B S T R A C T

Wildlife sightings are not always guaranteed. To address this risk, tour operators often offer a money-back guarantee as a refund mechanism. However, studies have overlooked the influences of such refund mechanisms on tourists' tour participation decisions and tourism revenue. We conducted choice experiments to examine the impact of such mechanisms using a case of Amami rabbit tourism in Japan. We found that the guarantee significantly influences the tourists' decision-making and tour revenue. In particular, we found that the expected tourist participation rate and tour guide revenue vary drastically depending on the probability of the rabbit encounter. The maximum expected revenue from the tour with a 90% chance was about 20 times larger than that with a 10% chance. This indicates that conserving wildlife to maintain the sighting probability raises tour benefits, creating a win-win situation by balancing conservation and tourism development.

1. Introduction

Tourism is one of the fastest growing industries. However, about 20% of it depends on recreation in and around environmentally protected areas (Balmford et al., 2009; Buckley, 2011). As part of this trend, wildlife viewing is a popular form of nature-based tourism.

In the US, wildlife tourism has been increasing. In fact, in 2016, more than 86 million people pursued some form of wildlife viewing, spending more than US$ 75 billion on wildlife tourism (US Fish & Wildlife Service, 2017).

Local communities, especially those in and around protected areas, depend on the revenue from such nature-based tourism (D. Biggs, Amar, Valdebenito, & Gelcich, 2016; R. Biggs et al., 2015; Kiss, 2004). These economic benefits contribute to the local economy and to biodiversity conservation (Adams & Infield, 2003; Buckley & Mossaz, 2018; Eshoo, Johnson, Duangdala, & Hansel, 2018; Steven, Castley, & Buckley, 2013). Gössling (1999) showed that locals who received more benefits from tourism were also more motivated than others to pursue biodiversity conservation (however, poorly designed tourism was also shown to degrade biodiversity) (Geffroy, Samia, Bessa, & Blumstein,

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https://doi.org/10.1016/j.tourman.2018.06.010
Received 5 January 2018; Received in revised form 5 June 2018; Accepted 7 June 2018
Available online 01 August 2018

2015; Pickering & Hill, 2007; Reynolds & Braithwaite, 2001; Steven, Pickering, & Guy Castley, 2011). At the same time, Naidoo, Fisher, Manica, and Balmford (2016) reported that substantial economic benefits from tourism had been lost because of illegal killing of elephants in Africa.

A well-established tourism market is believed to prevent illegal hunting and contribute to wildlife conservation. Thus, it is important to support growing interest in viewing wildlife, and benefits thereof, in order to enhance environmental conservation and protection (Schwoerer, Knowler, & Garcia-Martinez, 2016).

To analyse tourist demand for wildlife viewing and provide effective management, researchers have pursued valuation studies. For example, Richardson, Rosen, Gunther, and Schwartz (2014), applying a contingent valuation method, found that park visitors were willing to pay an additional US$ 41 in entrance fees for continued roadside bear-viewing opportunities in Yellowstone National Park. Kubo and Shoji (2016), using a choice experiment, showed that there was substantial potential demand for bear-viewing tours, which in turn, could decrease the bear accident risk based on tourist satisfaction. C. K. Lee, J. H. Lee, Kim, and Mjelde (2010) used a choice experiment to estimate tourist willingness-to-pay for birdwatching. In another choice experiment survey in Uganda, Naidoo and Adamowicz (2005a, 2005b) showed that, based on the estimated revenues from birdwatching, the biodiversity benefits exceeded the management costs at the rainforest. Donovan and Champ (2009), using a travel cost method, found that the value associated with access to elk viewing exceeded the annual operating budget at the Jewell Meadows Wildlife Area in Oregon. These findings imply that visitors put a high value on guaranteed wildlife viewing.

Unfortunately, wildlife sightings are not always guaranteed. This means that tourists who expect to see wildlife may be very unhappy when they do not (Curtin, 2013). To address this risk, many tour operators now offer a money-back guarantee as a refund mechanism (Meynecke, Richards, & Sahin, 2017; Richards et al., 2015). There are various types of such money-back guarantees. These include, for example, a coupon to participate in another tour, as in the case of whale watchers in Hawaii who do not see whales. In the case of the Amami rabbit, which is an endangered and iconic wildlife species in Japan, tour participants to Amami Oshima, Japan who do not see rabbits can receive 50% of their money back.

Although the money-back guarantee is expected to increase tour numbers, such risk could also result in the failure of the nature-based tourism business model. In other words, the money-back guarantee could significantly reduce tourism revenue, depending on the tour fee, refunding ratios (e.g. 50% guarantee), and the number of tour participants. However, the tradeoffs around the money-back guarantee have not been discussed in this context. Estimating demand for wildlife viewing without the guarantee offered by tour operators could, therefore, mislead stakeholders, such as wildlife managers and policymakers. To address this, we examine the case of the Amami rabbit tours in Japan to investigate tourist preferences for wildlife viewing, while taking into account money-back guarantees.

In business and marketing, the money-back guarantee is a well-known refund mechanism (Desmet, 2014; Suwelack, Hogreve, & Hoyer, 2011) used to reduce the likelihood of consumers being dissatisfied. It also improves their perception of the purchased goods as high in quality and reliability (Boulding & Kirmani, 1993; Heiman, McWilliams, & Zilberman, 2001; Moorthy & Srinivasan, 1995). Although it remains challenging to understand exactly how a money-back guarantee affects human behavior and decision-making (d'Astous & Guèvremont, 2008), scholars have shown that such guarantees can significantly influence consumer decision-making (Boulding & Kirmani, 1993; Erevelles, Roy, & Yip, 2001).

Despite its widespread use and reports (Evans, Dana Clark, & Knutson, 1996; Meynecke et al., 2017; Scott & Lemieux, 2010), no studies have quantitatively examined how the design of a tour with money-back guarantees can affect customers' participation decisions and tour guides' revenue.

This study thus makes several unique contributions to the literature. First, we statistically model consumers' preference towards the design of tours with money-back guarantees and their participation decisions as a function of the tour price and the money-back guarantee ratio. The estimated model then allows us to calculate how consumers' participation decision and tour guides' revenue are affected by the price, money-back guarantee ratio, and sighting probability. We then identify the revenue-maximising design under various levels of sighting probabilities. No prior studies on money-back guarantee have considered how tour guides could change the tour design to attract participants.

Using the case of the Amami rabbit tours in Amami Oshima, Japan, the main objective of this study is to investigate the preferences of tourists for wildlife viewing by taking into account money-back guarantees. We apply the discrete choice model as the valuation method to assess tourist willingness-to-pay for Amami rabbit-viewing. As described in section 2, our methodology is based on previous valuation studies that include risk and uncertainty attributes (see Cameron, 2005; Glenk & Colombo, 2013; Rolfe & Windle, 2013; Rolfe & Windle, 2015; Torres, Faccioli, & Font, 2017). To the best of our knowledge, this is the first study to include the money-back guarantee in a valuation method for nature-based tourism.

2. Background and method

2.1. Amami Oshima and Amami rabbit-viewing

The island that forms our study area is located south west of the Japanese archipelago and about 400 km from Kagoshima city, the capital of Kagoshima prefecture. Amami Oshima is the largest (712.39 km^2) among the Amami Islands; the population was about 65,000 citizens in 2015. The island has a unique ecosystem of subtropical rainforests and a variety of endemic and endangered wildlife, including the Amami rabbit (*Pentalagus furnessi*). The uniqueness of its ecosystems led to the designation of the island as part of the Amami Gunto National Park in 2017. The island's administrators expect it to be designated a Natural World Heritage site in the future.

Since this unique ecosystem and its wildlife attract many tourists throughout the year, nature-based tourism is one of the most important industries for local communities on the island. The Amami rabbit is a good example to use in our experiment, as it is an endangered and an iconic animal. It represents the importance of balancing nature conservation and sustainable tourism.

Each rabbit-viewing tour is conducted at night. In general, tourists enjoy viewing the rabbits from their cars as part of tours organised by local operators. To the best of our knowledge, there are five companies that provide Amami rabbit tours with the most promising rabbit encounters on their tours. For example, a company may pledge that tourists will see a rabbit with a 99% probability, and if they do not, it will refund half the tour fee.

Thus far, there are few rules and regulations regarding Amami rabbit tours, although low-speed driving is recommended on road sections where the rabbits can be seen. However, the Ministry of the Environment has noted that there is a risk of Amami rabbits being killed on roads. In 2016, more than 40 rabbit deaths were reported, although the cause of death was not identified in most cases (Hiragi, Kimoto, & Iwamoto, 2017). In this context, it appears critical to identify the tourist value of the Amami rabbit in order to enhance conservation.

2.2. Questionnaire design

Through interviews with local stakeholders and by analysing the attributes of existing tours, we designed a choice experiment survey. This survey included three attributes: the chance of a rabbit encounter, the money-back guarantee ratio associated with the tour fee, and the

	Tour 1	Tour 2	No participation
The chance of Amami rabbit encounter	90% chance	10% chance	No participate any tours
Tour fee	3,000 JPY	10,000 JPY	
The ratio of money-back guarantee	90%	50%	
	1	2	3

Fig. 1. A sample of choice sets.

tour fee. The chance of a rabbit encounter is divided into five levels: 10%, 30%, 50%, 70%, and 90%. For example, a 30% chance means that tourists will see an Amami rabbit three times if they participate in 10 tours. The money-back guarantee ratio is divided into three levels (10%, 50%, and 90%), and the tour fee, into five levels (1000 JPY, 3000 JPY, 5000 JPY, 8000 JPY, and 10,000 JPY; 100 JPY equals almost US$ 1). The value of the refund when tourists do not see a rabbit changes with both the money-back guarantee level and the tour fee. For example, if the money-back guarantee is 10% and the tour fee is 1000 JPY, the tourist receives 100 JPY when she/he does not see any Amami rabbits.

To construct a statistically efficient design, we used the software ©Ngene (Choice Metrics Pty Ltd, Sydney, Australia), and applied the D-efficient experimental design to the survey. We created 20 choice sets and blocked them into four groups of five sets. In other words, each participant was asked to respond to five choice sets (see Fig. 1 for a sample choice).

2.3. Econometric models and model specification

To understand tourist tour design preferences, we apply a random utility model. The model assumes that utility is composed of two terms: an observable deterministic term and an unobservable random term (McFadden, 1974). Equation (1) describes the utility U of individual (tourist) i from choosing alternative j:

$$U_{ij} = V(\phi, x_{ij}) + \varepsilon_{ij}. \tag{1}$$

The deterministic term is shown as $V(\phi, x_{ij})$, where ϕ represents the parameters related to the attributes x_{ij}. The random term ε_i captures the unobserved factors that affect the choice of individual i.

Here, we assume that tourist decisions about tour design with a money-back guarantee are explained by the expected utility theory, which is commonly used to address decisions under risk and uncertainty (von Neumann & Morgenstern, 1944). So far, there have been few studies on money-back guarantee in tourism (Champ, Flores, Brown, & Chivers, 2002; Heiman, Just, McWilliams, & Zilberman, 2015; Manlosa, Briones, Alcantara, & Florece, 2013). However, limited valuation studies have addressed how this guarantee influences tourist decision-making. Thus, the present study has applied the concepts and methodological developments of recent valuation literature that address uncertainty (Cameron, 2005; Glenk & Colombo, 2013; Rolfe & Windle, 2013; 2015; Torres et al., 2017).

In order to identify the expected utility of an alternative, we first need to model utility for the two potential events, that is, whether or not a rabbit is sighted. In this study, we use the following model:

$$\begin{aligned} U_{ij} &= \beta_0 + \beta_1 \cdot I[rabbit = 1] \\ &+ \beta_2 fee_j (1 - MBG_j + MBG_j \cdot I[rabbit = 1]) + \varepsilon_{ij}, \end{aligned} \tag{2}$$

where $I[\cdot]$ is the indicator function that takes 1 if the tourist sees a rabbit, and 0 otherwise. MBG stands for a money-back guarantee in the model. Thus, if the tourist sees a rabbit, the utility of that trip is

$$U_{ij}(rabbit = 1) = \beta_0 + \beta_1 + \beta_2 fee_j + \varepsilon_{ij}. \tag{3}$$

On the other hand, if no rabbits are sighted, the utility of that trip is

$$U_{ij}(rabbit = 0) = \beta_0 + \beta_2 fee_j \cdot (1 - MBG_j) + \varepsilon_{ij}. \tag{4}$$

Now, consider an alternative j with ρ_j probability of seeing a rabbit. Then, the expected utility of the alternative is the probability-weighted utility of the two potential events. Therefore, the expected utility of tour design j is

$$\begin{aligned} E[U_{ij}] &= \rho_j \cdot U_{ij}(rabbit = 1) + (1 - \rho_j) \cdot U_{ij}(rabbit = 0) \\ &= \rho_j(\beta_0 + \beta_1 + \beta_2 fee_j + \varepsilon_{ij}) + (1 - \rho_j)(\beta_0 + \beta_2 fee_j \cdot (1 - MBG_j) + \varepsilon_{ij}) \\ &= \beta_0 + \rho_j \beta_1 + \beta_2(\rho_j \cdot fee_j + (\rho_j \cdot fee_j + (1 - \rho_j) \cdot fee_j \cdot (1 - MBG_j)) + \varepsilon_{ij} \\ &= \beta_0 + \rho_j \beta_1 + \beta_2(fee_j - (1 - \rho_j) \cdot fee_j \cdot MBG_j) + \varepsilon_{ij}. \end{aligned} \tag{5}$$

In the random utility framework, $V(\phi, x_{ij}) = \beta_0 + \rho_j \beta_1 + \beta_2(fee_j - (1 - \rho_j) \cdot fee_j \cdot MBG_j)$ is the 'deterministic part', and ε_{ij} is the part unknown. Thus, the independent variables included in the model are the intercept, ρ_j, and $(fee_j - (1 - \rho_j) fee_j \cdot MBG_j)$. We estimate their respective coefficients β_0, β_1, and β_2, which fully characterise utility under the two potential events: Equations (3) and (4). Although we also specified a model with a quadratic-form of the monetary term (see the Appendix), only the estimation results based on the utility function using Equation (5) will be presented hereafter because the parameter of the quadratic-form was not statistically significant.

Assume that each ε_{ij} is an independently and identically distributed extreme value. If the parameters are fixed, the choice probability is calculated using the conditional logit (CL) model:

$$P_{ij} = \frac{\exp(V(\phi, x_{ij}))}{\sum_k \exp(V(\phi, x_{ik}))}. \tag{6}$$

If the parameters vary across individuals with density $f(\phi)$, the choice probability is

$$P_{ij} = \int \frac{\exp(V(\phi, x_{ij}))}{\sum_k \exp(V(\phi, x_{ik}))} f(\phi) d\phi, \tag{7}$$

which is the random parameter logit (RPL) probability.

We apply the RPL model, in addition to the basic CL model, to the data from the choice experiment survey. In the RPL model, coefficients, on the attributes, are assumed to be normally distributed. The main advantage of the RPL model over the CL model is its ability to capture preference heterogeneity (McFadden & Train, 2000; Train, 2009). This allows us to predict tourists' participation decision individually when we conduct simulation analysis.

2.4. Simulation process

We estimate individual parameters with a normal distribution using both coefficients of each parameter and the standard deviations based on the estimation results of the RPL. Then, we calculate the expected tour participation rate and the tour revenue using the individual parameters stated above.

Assume that tourist i considers whether or not to participate in tour j. Then, the expected utility of participation is,

$$U_{ij} = \beta_0 + \beta_1 \cdot I[rabbit = 1] + \beta_2 fee_j (1 - MBG_j + MBG_j \cdot I[rabbit = 1]) + \varepsilon_{ij}. \quad (8)$$

The expected utility of nonparticipation is

$$E[U_{i0}] = V(\phi, x_{i0}) + \varepsilon_{ij} = \beta_0 + \alpha_0 + \varepsilon_{i0}, \quad (9)$$

where α_0 is the alternative specific constant of nonparticipation. The probability of participation is

$$\begin{aligned} \pi_{ij} &= \Pr[E[U_{ij}] > E[U_{i0}]] \\ &= \int \frac{\exp(V(\phi, x_{ij}))}{\exp(V(\phi, x_{ij})) + \exp(V(\phi, x_{i0}))} f(\phi) d\phi \\ &= \int \frac{\exp\left[\rho_j \beta_1 + \beta_2 \left(fee_j - \left(1 - \rho_j\right) \cdot fee_j \cdot MBG_j\right)\right]}{\exp\left[\rho_j \beta_1 + \beta_2 \left(fee_j - \left(1 - \rho_j\right) \cdot fee_j \cdot MBG_j\right)\right] + \exp[\alpha_0]} f(\phi) d\phi. \end{aligned} \quad (10)$$

The maximisation problem of expected revenue of the tour is

$$\max_{fee_j, MBG_j} \pi_{ij} [\rho_j \cdot fee_j + (1 - \rho_j) fee_j \cdot MBG_j]. \quad (11)$$

Thus, the optimal combination of fee_j and MBG_j can be calculated by solving the maximisation problem.

2.5. Sampling and data

In August 2016, we conducted a questionnaire survey at the Amami airport. One thousand questionnaires were randomly distributed to visitors to Amami Oshima. We received responses from the 348 visitors by mail. After excluding nonresponses to the choice experiment questions, we used 339 responses for this analysis. The socio-demographics of the respondents are summarised in Table 1. The ratio of female to male respondents was nearly equal. The representative age groups were those in their 30s (23.3%) and 40s (32.2%). The number of respondents who had visited the island before was 137 (40.4%).

3. Results

3.1. Estimation results

Parameter estimates of both models are presented in Table 2. The CL model is described in the left columns of the table, while the RPL model in the right columns.

In both models, the utility coefficient of each attribute is the same sign, and statistically significant. The coefficient of the probability of seeing a rabbit is positive, the coefficient of the monetary term is negative, and the coefficient of the constant is positive. In addition, with regard to the RPL model, all coefficients of the standard deviations from the mean coefficient are statistically significant. The value of log likelihood shows that the RPL model provides a better fit with the data than the CL model. This implies that there were preference heterogeneities of respondents for each attribute, which allowed us to estimate the individual parameters for the simulation model.

3.2. Simulation results

Using the estimated results of the RPL model, the expected tour participation rate and tour revenues were calculated. As described in Fig. 2, the higher the probability of a rabbit sighting and the higher the ratio of the money-back guarantee, the higher the likelihood of tourist participation in a tour. Indeed, with a 10% chance of seeing a rabbit, the expected maximum tour participation rate is 0.347. Similarly, the rate is 0.923 with a 50% chance, and 0.996 with a 90% chance. However, the expected tour revenue is sensitive to the combination of money-back guarantees and tour fees. The expected maximum tour revenue with a 10% chance is 222.7, with a 50% chance is 1688.2, and with a 90% chance is 4545.2.

4. Discussion

This study explored the influence of a money-back guarantee on tourists' decision-making and tour revenues. We discussed the mechanism that could be implemented to encourage balance between tourism development and wildlife conservation by considering revenue-maximisation processes.

Fig. 2 presents our simulation results to visualise how the tour design parameters, tour fee, and money-back guarantee ratio affect participation rates and tour guide revenue depending on the probability of sighting rabbits. The impacts of tour fee and the ratio of money-back guarantee on the participation rate are influenced heavily by sighting probability. People are sensitive to the level of tour fee with higher probability of sighting. Nevertheless, the money-back guarantee plays an important role when the probability of sighting is relatively low. Thus, it is important for tour operators to monitor the chance to choose the best combination of the level of tour fee and money-back guarantee ratio.

Here, we provide deeper insights on participation rate and tour revenue. In terms of the participation rate, the higher the money-back guarantee and the lower the tour cost, the higher the likelihood that tourists will participate in the tour. With a 90% chance of seeing a rabbit, the expected maximum participation is almost 100%. However, about one-third of tourists participate when there is only a 10% chance. Conversely, maximum tour revenue is sensitive to the combination of tour fee and money-back guarantees. However, the expected tour revenue still depends significantly on the probability of seeing the Amami rabbit. The maximum expected revenue from the tour with a 90% chance (about 4500 JPY) is about 20 times larger than that with a 10% chance (about 220 JPY). This shows that preserving the opportunity raises benefits to local residents and communities. In other words, conserving rabbits to maintain high sighting probability is beneficial to local residents and conservationists, as well as tour guides. Their interests are evidently aligned.

Our research site, Amami Oshima island, has been designated a national park, and its administrators expect it to be designated as a Natural World Heritage site in the near future. Such designations are expected to increase tourist numbers, possibly deteriorating the habitat because of increased recreational impacts (Geffroy et al., 2015; Larson, Reed, Merenlender, & Crooks, 2016; Rogala et al., 2011). Our findings—that lower probability of seeing a rabbit causes lower expected

Table 1
Sample characteristics (n = 339).

Characteristics	
Gender	Female 174 (52.9%), Male 155 (47.1%)
Age	10s 9 (2.65%), 20s 55 (16.2%), 30s 79 (23.3%), 40s 109 (32.2%), 50s 65 (19.2%), 60s 14 (4.13%), 70s and older 5 (1.47%), Unknown 3 (0.885%)
Visiting experience to the island	1st time 201 (59.3%), 2nd time 31 (9.14%), 3rd time 16 (4.72%), 4th time 8 (2.36%), 5th time 15 (4.42%), 6th time and more 67 (19.8%), Unknown 1 (0.295%)

Table 2
Results of the conditional logit and random parameter logit models.

	Conditional logit model			Random parameter logit model					
	Coefficient	SE	P > |z|	Coefficient	SE	P > |z|	S.D. Coefficient	SE	P > |z|
β_0: Alternative specific constant	1.290	0.109	0.000	1.411	0.222	0.000	2.453	0.354	0.000
β_1: Probability of rabbit	4.094	0.195	0.000	7.790	0.557	0.000	4.163	0.605	0.000
β_2: Monetary term	−0.306	0.018	0.000	−0.744	0.066	0.000	0.466	0.056	0.000
Number of choice sets	1665			1665					
Log likelihood	−1424.2526			−1099.4646					

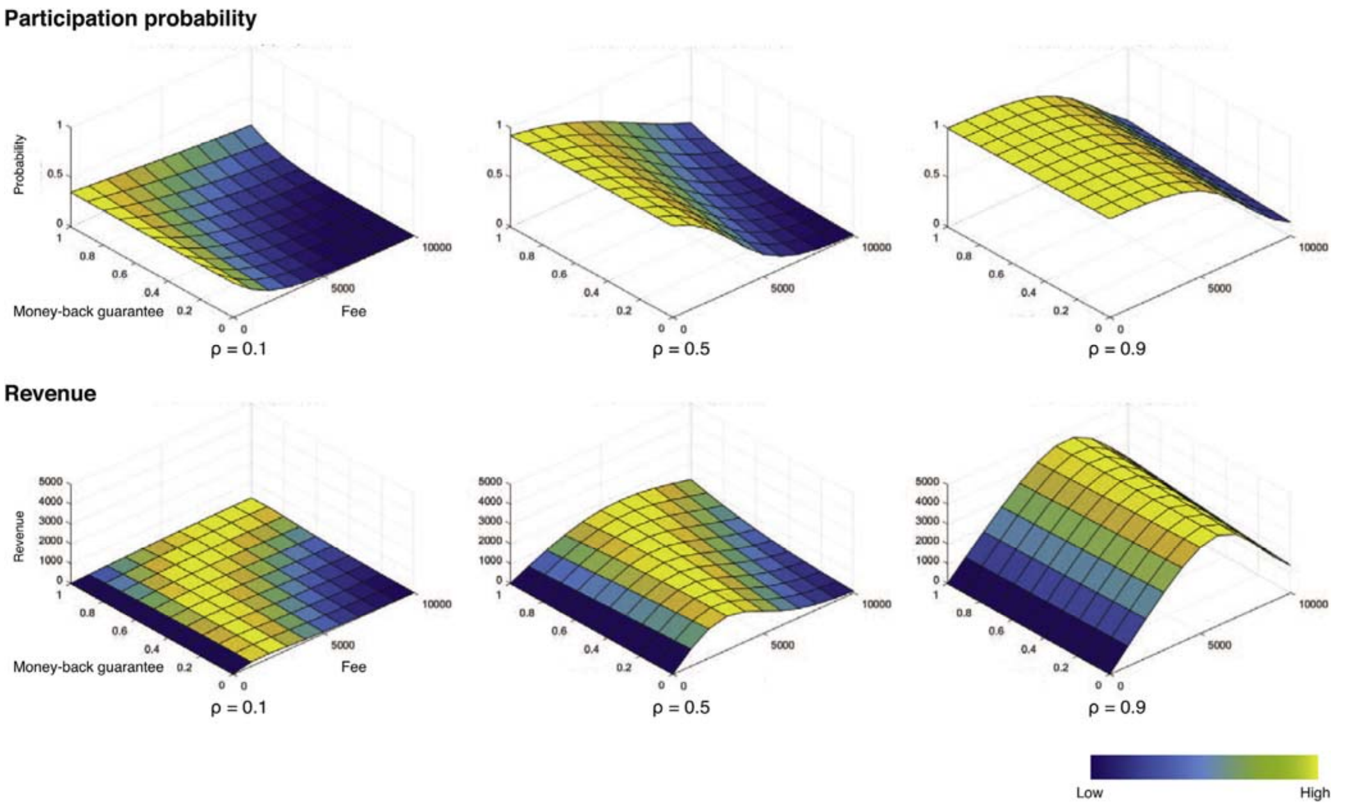

Fig. 2. Expected tour participation probability and tour revenues of a tour guide under the scenarios with the probabilities of sighting a rabbit ($\rho = 0.1$, 0.5, 0.9).

revenue—could encourage people to minimise their impact on the habitat, and instead, contribute to win-win designs that would help balance conservation and tourism development.

In terms of methodological contribution, we demonstrated a revenue-maximising design for wildlife tours under risk by applying a choice experiment using the expected utility model. This is the same framework used in Glenk and Colombo (2013). However, as some studies use other models, such as a partial expected utility model (Rolfe & Windle, 2015), further research that incorporate different econometric modelling frameworks may help better understand consumer behaviour under risk. For example, Heiman et al. (2015) studied consumer response to money-back guarantees in a general context by applying prospect theory, although the authors did not conduct a valuation study. Historically, the expected utility theory has received some criticism because of the rational behaviour assumption (Bocquého, Jacquet, & Reynaud, 2014; Shaw & Woodward, 2008; Thaler, 1980; Tversky & Kahneman, 1992). Integrating prospect theory into our model may help further our understanding of consumer behaviour in the tourism context. Based on the prospect theory (Barberis, 2013; Kahneman & Tversky, 1979; Tversky & Kahneman, 1992), perceived utility from refunded cash would differ from the same amount of tourism fee (i.e. the utility of a US$ 1 fee would not equal the utility of a US$ 1 money-back guarantee). How people make decisions and behave in tourism that involves elements of uncertainty and risk still remains an open question.

Nevertheless, our study makes an important contribution to the body of literature that aims at uncovering conservation benefits from wildlife tourism, considering the uncertainty of wildlife sightings.

5. Conclusion

Wildlife tourism provides substantial benefits to local communities; it enhances their motivation for wildlife conservation (Kubo & Shoji, 2014; Schwoerer et al., 2016). Previous studies have shown the potential demand for a wide variety of wildlife viewing (Richardson et al., 2014; Steven et al., 2013). However, scarce research has addressed the uncertainty of wildlife sightings on such tours, even though it is a common and important challenge in tourism (Evans et al., 1996; Meynecke et al., 2017; Scott & Lemieux, 2010).

Our study quantified how a well-known refund mechanism, that is, a money-back guarantee, can affect tourists' participation decisions and tour guides' revenue in wildlife tourism by using valuation studies handling risk and uncertainty (Rolfe & Windle, 2015; Segerson, 2017; Torres et al., 2017). Based on an econometric analysis, we presented a revenue-maximising design under various levels of wildlife sighting probabilities, as well as discussions on conservation incentives for tour guides and local authorities. The findings evidently show that preserving the opportunity for wildlife sighting raises benefits for local residents and communities, allows people to be incentivised to minimise their impact on wildlife habitats, and enhances win-win designs that help balance conservation and tourism development.

Author contributions

T.K. conceived, designed and coordinated the study. T.M. contributed to the development of economic theory. T.K. and T.M. analysed the data. K.K. conducted the simulation. T.K. wrote the manuscript with contributions from T.M. and K.K.

Acknowledgements

We acknowledge financial support from the Environmental Economics and Policy Study, Ministry of the Environment, Japan (Research on economic evaluation of natural and environmental policy in Japan) and the Japan Society for the Promotion of Science (No. 16K00697). We appreciate the helpful comments of Dr. Shoji and Dr. Tsuge on the research design, the helpful suggestions of Dr. Glenk for the analysis and the helpful comments of the journal editor and anonymous reviewers on the early draft. We thank Mameno, K., and Mitsui, S. for their help in conducting the on-site questionnaire survey.

Appendix

Here, we consider a model with a quadratic-form of the monetary term. We assume that the utility of a trip if the tourist sees a rabbit is

$$U_{ij}(rabbit = 1) = \beta_0 + \beta_1 + \beta_2 fee_j + \beta_3 fee_j^2 + \varepsilon_{ij}. \tag{12}$$

On the other hand, the utility of a trip if no rabbit is seen is

$$U_{ij}(rabbit = 0) = \beta_0 + \beta_2 fee_j \cdot (1 - MBG_j) + \beta_3 [fee_j \cdot (1 - MBG_j)]^2 + \varepsilon_{ij}. \tag{13}$$

Based on Equations (12) and (13), the expected utility of the alternative, considering alternative j with ρ_j probability of seeing a rabbit, is the probability-weighted utility as follows:

$$\begin{aligned} E[U_{ij}] &= \rho_j \cdot U_{ij}(rabbit = 1) + (1 - \rho_j) \cdot U_{ij}(rabbit = 0) \\ &= \rho_j(\beta_0 + \beta_1 + \beta_2 fee_j + \beta_3 fee_j^2) + (1 - \rho_j)(\beta_0 + \beta_2 fee_j \cdot (1 - MBG_j) + \beta_3 [fee_j \cdot (1 - MBG_j)]^2) + \varepsilon_{ij} \\ &= \beta_0 + \rho_j \beta_1 + \beta_2(\rho_j \cdot fee_j + (1 - \rho_j) \cdot fee_j \cdot (1 - MBG_j)) + \beta_3(\rho_j fee_j^2 + (1 - \rho_j) \cdot fee_j^2 \cdot MBG_j^2) + \varepsilon_{ij} \\ &= \beta_0 + \rho_j \beta_1 + \beta_2(fee_j - (1 - \rho_j) \cdot fee_j \cdot MBG_j) + \beta_3(fee_j^2 - 2(1 - \rho_j) \cdot fee_j^2 \cdot MBG_j - (1 - \rho_j) \cdot fee_j^2 \cdot MBG_j^2 + \varepsilon_{ij}. \end{aligned} \tag{14}$$

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